the KEYBOARD SWAP by john price

Did you ever work on one computer that wasn't your own and come home
and feel uncomfortable typing on your own computer? Back in the 'old
days', my first computer was an Atari 400 w/ 16k of RAM. It was a
real powerhouse then and a real bargain for the $75 that I paid for
it. The IBM PC was just getting off of the drawing boards then.
That particular Atari had a nasty membrane keyboard that was unwieldy
to anyone who ever typed on a modern electric typewriter. At the
time, third-party vendors offered 'enhanced' full-stroke keyboards
for a mere $85! The cost of upgrading the user interface was more
than the computer had cost me. I opted to get an 800xl when they
came out instead.

Well it's twelve years later and I'm still an avid Atari-enthusiast.
My
machines of past are exactly that though- machines of past. I am
running on an XE Game System equivalent to a 65XE or 800xl. One of
the things that I liked about it when I bought it, was the detachable
keyboard. The cable was only about a foot and a half long. This
situation, I remedied quickly by purchasing a 10 foot extension (15-
pin M-F). Great! Now I can sit on the couch way across from the TV
and not have a bunch of I/O wires, power cables and monitor cords
lying around just waiting for someone to trip.

Over time, I got used to the mushiness of the modern Atari keyboard.
Yes. But I never liked it. So Wile E. Coyote went back to the ol'
drawing board and what follows is what I came up with and built into
my system.

the Swap!

I like the keyboard on the Atari 800 the best. Every key is an
individual hard switch soldered onto a piece of ordinary PC board.
This board can be purchased for $40.00 from B&C Computer Visions in
Santa Clara, CA. I did not however. Old computers such as the 800,
Vic-20 and TI99/4a can be found at many thrift stores that sell other
things than clothes such as Goodwill and Salvation Army. If your as
lucky as I, even found on a curbside pile of refuse. Typically, such
stores charge anywhere from $4 to $20 for the whole computer "As-Is".
If you buy it and it works- Bonus!. If not, oh well, we're after an
800 keyboard and as long as that's not broke, you've already saved
money.

Not all Atari keyboard techology is the same. On an XE, the keys are
merely little anchored pieces of plastic that press a folded piece of
clear plastic with metallic contacts together. A serious deficit in
quality, but functional and very cost-effective to manufacture. The
hard part of this whole project was trying to teach these different
eras of technology to get along.

After opening both computer cases and removing both keyboards from
their connections, I realized that they were not even pin-to-pin
compatible. I counted them up, 23 connections on the XE and only 18
on the 800. After pondering how much determination I had to do this
anyway, I took a close look and realized that five of the 23 contacts
on the XE were devoted to the console switches, i.e. Reset, Start
etc.. Well they aren't for anything on an XE Game System as console
switches are on the main computer part itself.

Take the 800 keyboard and face it to you the way you would if you
were going to type with it. Pull the cable out from underneath
toward you so that the pin slots are facing you. Make a note of the
alignment. On mine, the left most wire is brown and the rightmost is
grey. I numbered these from left to right, from one to eighteen.

Now face the XE system board to you in the same fashion. Pull the
thin , clear connection strip from the black connector on the PC
board. Set this keyboard aside. Look closely at the black connector
that the keyboard was just removed from. For easier soldering, I
used a pliers to bend this connector upright. I found nothing at an
electronic parts store that would fit in this connector. If you wish
to chicken out, this is the point of no return. The procedure I will
describe is a one-way trip as a hot soldering iron will damage this
connector's plastic enough that the original keyboard will not fit
back in this slot.

I numbered these slot connections in the same way as the 800's, only
this time from one to twenty-four. Now I used some thin electronic
wire, different colors help. I cut this wire into approx. 8" pieces
and on one end stripped the plastic coating at about a quarter inch
from the end. On the other side, I stripped a little more, I'd say a
third inch. To make final testing easier, I attached male crimp pins
with a pliers to the third inch stripped ends. These are the same
male pins used in assembling your own computer cables; the RS232 DB
type that fit in sub-connectors. These pins are extremely cheap ($3
per hundred) and are available at a good electronic part store.
(NOTE: Radio Snack doesn't count, I said good parts store). These
are not necessary, but sure make life easier.

Now I soldered the quarter-inch stripped end of these wires to the
black connector metal connection points using some thin rosin-core
solder. Only eighteen wires are needed. Skip pins 1, 3, 21, 22, 23,
and 24. Once I had these connections soldered to the wires I made, I
used an Ohmeter in the 1k mode to test continuity from the back side
of the PC board to the male pin ends I've assembled. If all solder
points are good, the needle should ping all the way on each test.
Now we're ready for the truth part.

The following is a list of the wire jumps from the XE computer end to
the 800 keyboard:

XE   800
24-slot   18-slot
conn.   conn.
**********   ********

```
     2 -------  18
     4 >>>>>>>  11
     5 -------   7
     6 <<<<<<<   8
     7 --------  5
     8 >>>>>>>  12
     9 -------  13
    10 #######  14
    11 =======  15
    12 +++++++   3
    13 -------   1
    14 >>>>>>>   2
    15 @@@@@@@   4
    16 -------- 17
    17 *******  16
    18 <<<<<<<   6
    19 -------- 10
    20+++++++++  9
```

Before testing on computer, be sure that no connector pins are touching each other on the 800 connection. I used a little tape on every other pin to insulate them from each other.

Now you should have a better feeling functional keyboard that won't fit into the case that the old keyboard came from. Ugly but much better functionality. I'll leave casing up to your own personal taste. On mine, I just screwed the new keyboard down to the backside of the old keyboard casing. The added bonus for me was that I'd rather have my extension cable trailing off of the right side of the keyboard than the left, so this situation worked just fine.

THIS FILE IS FOR THE RELIGIOUSLY DESTRUCTIVE. IF YOUR COMPUTER IS A NICE HOME ORNAMENT FOR YOU, I DO NOT RECOMMEND THIS PROJECT. IF HOWEVER, YOU ARE LIKE ME, STRIVING TO DEMAND BETTER, YOU SHOULD BE VERY SATISFIED WITH THE RESULTS A TRUE-CONTACT KEYBOARD LIKE THE 800'S YIELDS. ENJOY!
(or disapprove)